

**CIHM
Microfiche
Series
(Monographs)**

**ICMH
Collection de
microfiches
(monographies)**



Canadian Institute for Historical Microreproductions / Institut canadien de microreproductions historiques

© 1997

Technical and Bibliographic Notes / Notes techniques et bibliographiques

The Institute has attempted to obtain the best original copy available for filming. Features of this copy which may be bibliographically unique, which may alter any of the images in the reproduction, or which may significantly change the usual method of filming are checked below.

- ☒ Coloured covers / Couverture de couleur
- ☐ Covers damaged / Couverture endommagée
- ☐ Covers restored and/or laminated / Couverture restaurée et/ou pelliculée
- ☐ Cover title missing / Le titre de couverture manque
- ☐ Coloured maps / Cartes géographiques en couleur
- ☐ Coloured ink (i.e. other than blue or black) / Encre de couleur (i.e. autre que bleue ou noire)
- ☐ Coloured plates and/or illustrations / Planches et/ou illustrations en couleur
- ☐ Bound with other material / Relié avec d'autres documents
- ☐ Only edition available / Seule édition disponible
- ☐ Tight binding may cause shadows or distortion along interior margin / La reliure serrée peut causer de l'ombre ou de la distorsion le long de la marge intérieure.
- ☐ Blank leaves added during restorations may appear within the text. Whenever possible, these have been omitted from filming / Il se peut que certaines pages blanches ajoutées lors d'une restauration apparaissent dans le texte, mais, lorsque cela était possible, ces pages n'ont pas été filmées.
- ☐ Additional comments / Commentaires supplémentaires:

L'Institut a microfilmé le meilleur exemplaire qu'il lui a été possible de se procurer. Les détails de cet exemplaire qui sont peut-être uniques du point de vue bibliographique, qui peuvent modifier une image reproduite, ou qui peuvent exiger une modification dans la méthode normale de filmage sont indiqués ci-dessous.

- ☐ Coloured pages / Pages de couleur
- ☐ Pages damaged / Pages endommagées
- ☐ Pages restored and/or laminated / Pages restaurées et/ou pelliculées
- ☒ Pages discoloured, stained or foxed / Pages décolorées, tachetées ou piquées
- ☐ Pages detached / Pages détachées
- ☒ Showthrough / Transparence
- ☐ Quality of print varies / Qualité inégale de l'impression
- ☐ Includes supplementary material / Comprend du matériel supplémentaire
- ☐ Pages wholly or partially obscured by errata slips, tissues, etc., have been refilmed to ensure the best possible image / Les pages totalement ou partiellement obscurcies par un feuillet d'errata, une pelure, etc., ont été filmées à nouveau de façon à obtenir la meilleure image possible.
- ☐ Opposing pages with varying colouration or discolourations are filmed twice to ensure the best possible image / Les pages s'opposant ayant des colorations variables ou des décolorations sont filmées deux fois afin d'obtenir la meilleure image possible.

This item is filmed at the reduction ratio checked below /
Ce document est filmé au taux de réduction indiqué ci-dessous.

10x		14x		18x		22x		26x		30x	
	12x		16x		20x		24x		28x		32x

The copy filmed here has been reproduced thanks to the generosity of:

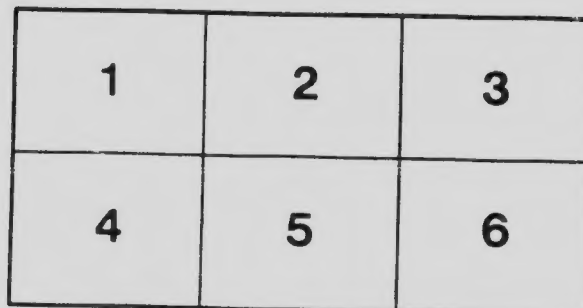
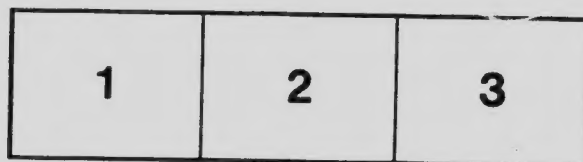
Library
Agriculture Canada

The images appearing here are the best quality possible considering the condition and legibility of the original copy and in keeping with the filming contract specifications.

Original copies in printed paper covers are filmed beginning with the front cover and ending on the last page with a printed or illustrated impression, or the back cover when appropriate. All other original copies are filmed beginning on the first page with a printed or illustrated impression, and ending on the last page with a printed or illustrated impression.

The last recorded frame on each microfiche shall contain the symbol → (meaning "CONTINUED"), or the symbol ▼ (meaning "END"), whichever applies.

Maps, plates, charts, etc., may be filmed at different reduction ratios. Those too large to be entirely included in one exposure are filmed beginning in the upper left hand corner, left to right and top to bottom, as many frames as required. The following diagrams illustrate the method:



L'exemplaire filmé fut reproduit grâce à la générosité de:

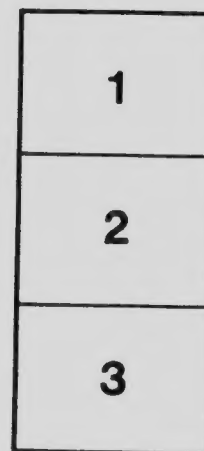
Bibliothèque
Agriculture Canada

Les images suivantes ont été reproduites avec le plus grand soin, compte tenu de la condition et de la netteté de l'exemplaire filmé, et en conformité avec les conditions du contrat de filmage.

Les exemplaires originaux dont la couverture en papier est imprimée sont filmés en commençant par le premier plat et en terminant soit par la dernière page qui comporte une empreinte d'impression ou d'illustration, soit par le second plat, selon le cas. Tous les autres exemplaires originaux sont filmés en commençant par la première page qui comporte une empreinte d'impression ou d'illustration et en terminant par la dernière page qui comporte une telle empreinte.

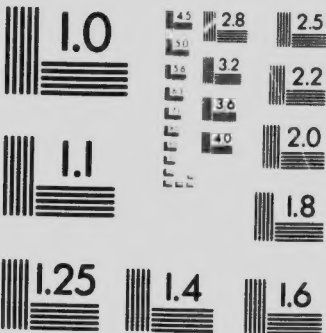
Un des symboles suivants apparaîtra sur la dernière image de chaque microfiche, selon le cas: le symbole → signifie "A SUIVRE", le symbole ▼ signifie "FIN".

Les cartes, planches, tableaux, etc., peuvent être filmés à des taux de réduction différents. Lorsque le document est trop grand pour être reproduit en un seul cliché, il est filmé à partir de l'angle supérieur gauche, de gauche à droite, et de haut en bas, en prenant le nombre d'images nécessaire. Les diagrammes suivants illustrent la méthode.



MICROCOPY RESOLUTION TEST CHART

(ANSI and ISO TEST CHART No. 2)



APPLIED IMAGE Inc

1653 East Main Street
Rochester, New York 14609 USA
(716) 482-0300 - Phone
(716) 288-5989 - Fax

DEPARTMENT OF AGRICULTURE

CENTRAL EXPERIMENTAL FARM

OTTAWA, CANADA

GROWING AND USING

CORN FOR ENSILAGE

OR

FORAGE CORN

BY

J. H. GRISDALE, B.Agr.

Agriculturist, Central Experimental Farm

BULLETIN No. 65

Published by direction of the Hon. SYDNEY A. FISHER, Minister of Agriculture, Ottawa, Ont.

MARCH, 1910

9-1

630.4

C212

Exp. Farms

Service

Bul.

3



DEPARTMENT OF AGRICULTURE

CENTRAL EXPERIMENTAL FARM

OTTAWA, CANADA

GROWING AND USING

CORN FOR ENSILAGE

OR

FORAGE CORN

BY

J. H. GRISDALE, B.Agr.

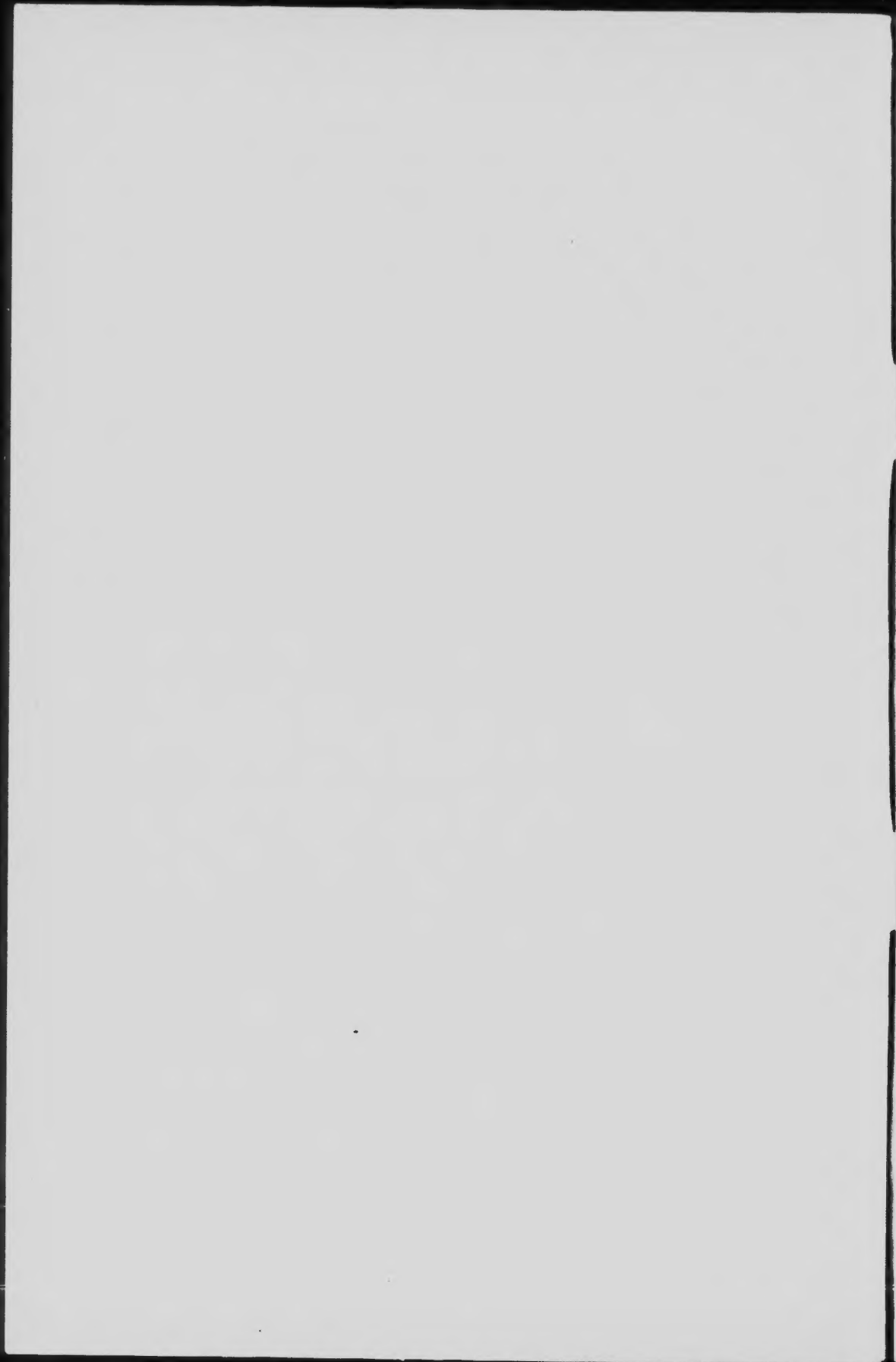
Agriculturist, Central Experimental Farm

BULLETIN No. 65

Published by direction of the Hon. SYDNEY A. FISHER, Minister of Agriculture, Ottawa. Ont.

12929-1

MARCH, 1910



To the Honourable
The Minister of Agriculture.

SIR,—I submit herewith, for your approval, Bulletin No. 65 of the Experimental Farm series, on the Growing and Using of Corn for Ensilage or Forage, which has been prepared by Mr. J. H. Grisdale, Agriculturist of the Central Experimental Farm.

This crop is one of very great and growing importance to the country, and its use for fodder, especially when made into ensilage, materially lessens the cost of feeding stock through the winter, and, from its nutritive and succulent properties, is a most useful factor in stimulating the dairy and stock industries. The present bulletin treats of the cost of producing this crop, and also of the regions over which it may be grown; the varieties most suitable for growing; and many other related points. The advantages which may be looked for from the growing of Indian corn are clearly shown.

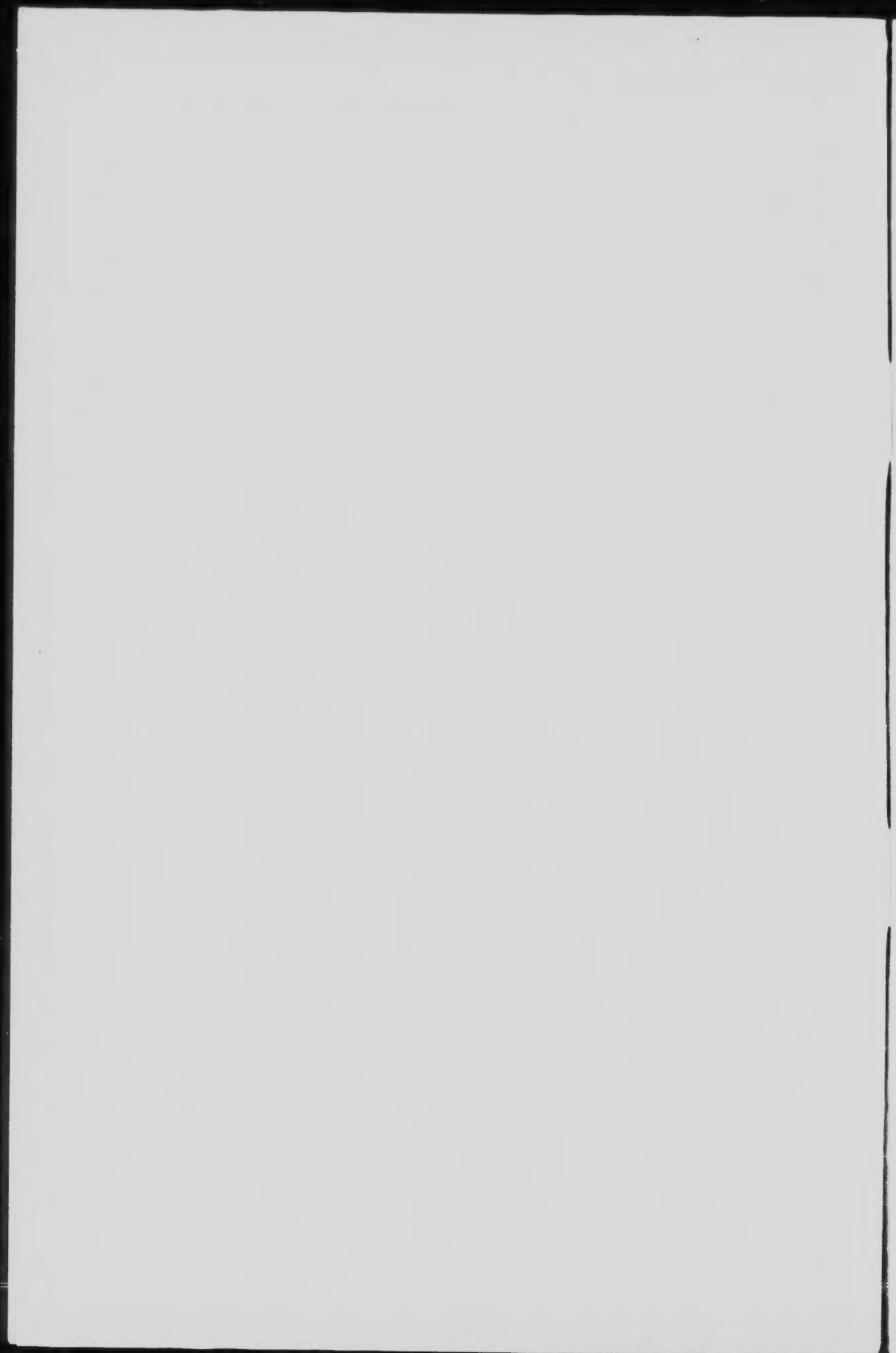
It is hoped that, by the wide distribution of the information contained in this bulletin, many farmers may be induced to grow this crop who have not hitherto tried it, and that thus the profits of farmers in the districts where corn can be grown to advantage may be increased.

I have the honour to be, sir,

Your obedient servant,

WM. SAUNDERS,
Director Experimental Farms.

OTTAWA, February 19, 1910.



INDEX TO SUBJECT MATTER.

	Page.		Page.
Cost of equipment and silos.	15	Reasons for growing forage or ensilage	
Cost of one ton corn in silo.	15	corn.	7
Cost of growing one acre corn.	15	Regions where it may be grown.	8
Cutting the corn.	12	Silos.	15
Early crop treatment.	11	Soil preparation.	8
Enemies and diseases.	12	Special preparation on clayey soils.	8
Ensilaging.	13	Summary of bulletin.	10
Feeding corn fodder.	13	The cut box.	13
Hand work.	11	Using ensilage.	14
Later cultivation.	11	Varieties to sow.	10
Making and preserving dry corn fodder.	12	When to harvest.	12
Manurial requirements of forage corn.	8	Where to grow corn.	8
Methods of seeding.	9	When to sow.	9
Rations including corn ensilage.	14		

INDEX AND DESCRIPTION OF CUTS.

- No. 1—Cutaway double disc three-horse harrow. A most excellent implement for preparing sod or tough land for corn.
- No. 2 Seeder set to sow corn in rows 42 inches apart, three-horse, twenty-marker, seven inch space.
- No. 3 Marker where corn is to be sown in hills by hand. Where regular check corn planter is used such marker is not necessary.
- No. 4—Hand corn planters. A good man can handle two of these and plant 4 acres a day when land is in good shape and well marked.
- No. 5—Two-horse, two-row, riding cultivator. Can be used till corn is four or five feet high. Start cultivating deeply, gradually ease up as season advances.
- No. 6—Walking single cultivator. Should be used after corn is too high for No. 7. Do not use hillers.
- No. 7—Varieties of corn suitable for ensilage in Canada.
- No. 8—Field of corn. Team weighing 3,500 lbs. Corn in glazing stage. Field cut 19 tons to the acre.
- No. 9—The harvest. Corn harvesters may be expected to cut an acre of heavy corn in about two hours. The corn may be handled on special low framed wagons but advantage is very slight and probably counterbalanced by awkwardness in handling wagons.
- No. 10 Cutting into the silo. A blower is shown at work. Cutting may be done by cut box and chain elevators. Three or four men can handle cut box driven by tread power or small gasoline engine.
- No. 11—Corn curing in shock. Where starting operations before silo is built or where any excess of corn over amount required for silo is grown it may be cured in shock as illustrated.
- No. 12 Ensilage at the feeding. Ensilage mixed with cut straw or chaff (100 lbs. ensilage, 16 lbs. straw or chaff) can be best handled in trucks. A large barrow will serve fairly well.



CORN FOR FORAGE OR ENSILAGE CORN.

Corn for forage or ensilage corn can be grown to advantage in almost all parts of Canada at present occupied by farmers or stockmen. Results have not been satisfactory in every case where efforts have been made to grow it, but this has very often been due to wrong cultural methods practised or unsuitable varieties grown, rather than to adverse climatic peculiarities.

Reasons for Growing Forage Corn.

The reasons for growing or making an attempt to grow this forage crop wherever live stock are kept in any numbers are numerous and cogent. A few of them follow:—

1. As a plant capable of yielding a large amount of valuable forage under a great variety of soil and climatic conditions, corn is without an equal.

2. When properly preserved, whether as ensilage or dried, it can be used as material to render other less palatable roughage more acceptable to farm animals.

3. It is the best plant or crop for ensiling that can be grown to advantage in Canada. It is practically a perfect crop for this purpose, hence it helps to solve the great problem of how to furnish an abundant and cheap supply of succulent food for winter or summer feeding of dairy or beef cattle.

4. When properly grown and well preserved as ensilage, it is the equal of or superior to roots in feeding value and palatability. It can, however, generally speaking, be more cheaply grown and more easily preserved than roots.

5. The labour of growing an acre of corn is of a character much more agreeable to perform and much less arduous than that of growing an acre of roots of any description.

6. Corn being a cultivated or hoed crop serves well to clean the land, that is, free it from weeds, so fitting it for grain growing, and putting it into shape to seed down to grass or hay.

7. Corn is a gross feeder and may be depended upon to make good use of a never so abundant supply of plant food. It is, for this reason, particularly well adapted to occupy that place in the rotation where humifying vegetable matter and a fairly liberal supply of barn yard manure unite to supply large quantities of plant food suitable for root, leaf and stem growth rather than for seed production.

8. The growing of corn on a fair proportion of the arable land on the farm will permit of keeping more cattle and so increase the revenue as well as augment the manure supply so essential to the maintenance of soil fertility.

9. Corn when preserved as ensilage, can be stored much more cheaply in much less space than any other roughage. In addition, stored in this way it will keep indefinitely and is always ready to feed.

10. In thirty years' experience in farming in the Ottawa valley, the writer has seen all kinds of grain crops utter failures, he has seen hay so light as to not pay for the making, and roots and potatoes practically nil, but in all that time he has never seen a failure in the corn crop. There has always been a fairly profitable return from the fields in corn.

Where to Grow it.

Corn will grow in any kind of soil, provided always that there is good drainage. Under draining is not absolutely necessary, although advisable here as with most other farm crops. On low-lying or level lands, ditches should be in good working condition and water furrows kept open all summer. If a choice of land may be made, then warm-bottomed light loamy soil may be expected to prove the most satisfactory under most weather conditions.

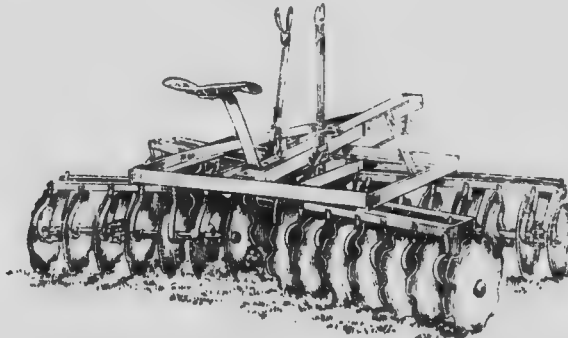
In the rotation, corn should follow clover hay, pasture or meadow. Stubble land as well as lands that have just been in hoed crops are not suitable since the supply of humus or humifying material is likely to be small, and, since corn needs much food such as these substances provide, it would probably fall short of a good crop on account of the lack thereof. Corn might advantageously come after grain or even follow a hoed crop, provided the land were very fertile or a very heavy dressing of manure were applied.

Manurial Requirements.

The best fertilizing material for corn is undoubtedly good barn-yard manure. A mixture of one part horse manure to three parts cattle manure applied green at the rate of 12 or 15 tons per acre, may be expected to give very good results. The application might be made in the fall, winter or spring, or during the preceding summer. If ploughed in, only a shallow furrow should be turned. Commercial fertilizers are not necessary, nor are they likely to prove profitable where the above mentioned dressing of farm yard manure can be applied.

Preparation of the Soil.

Where clay land is to be used for corn, it is generally well to plough in the autumn, turning a well set-up moderately deep furrow, (6 to 8 inches deep), being careful of course to go no deeper than usual. If light land is to be used, it is generally advisable to plough in the spring, turning a flat shallow furrow, (4 or 5 inches deep). In either case the manure may be ploughed in or worked in on the surface with the disc harrow.

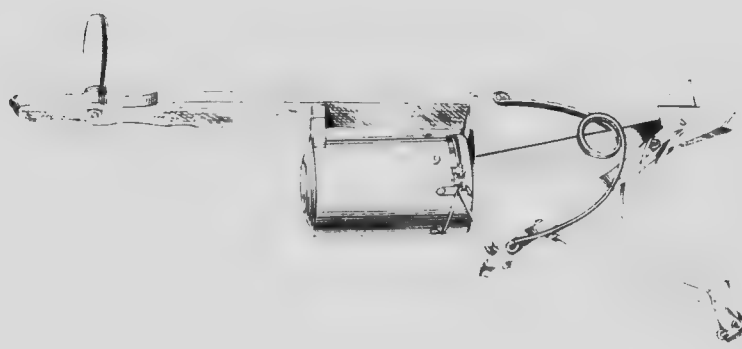
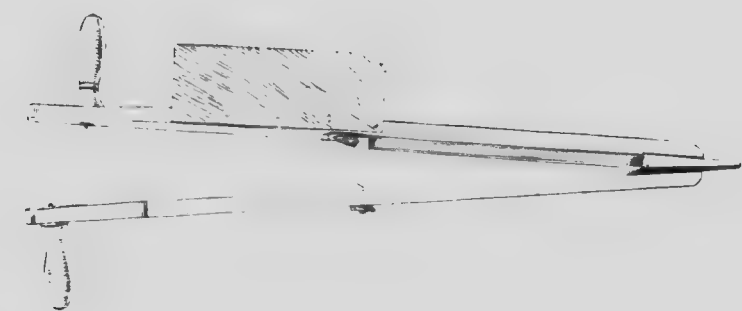


No. 1.—Cutaway Double Disc, Three-horse Harrow.

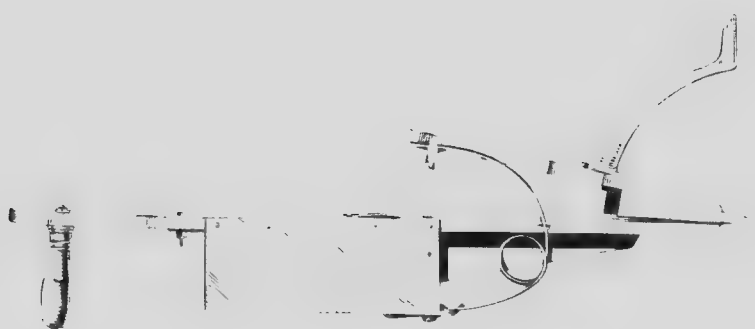
The land should be worked down till a smooth, mellow, yet solid seed bed has been prepared. To get the land into such shape, it may be necessary to disc and roll several times as well as work with a smoothing harrow. In any case, no planting should be done until what might be called a perfect seed bed has been prepared. Success or failure will depend very largely upon this feature of thorough soil preparation before seeding.

Special Preparation for Level or Clayey Lands.

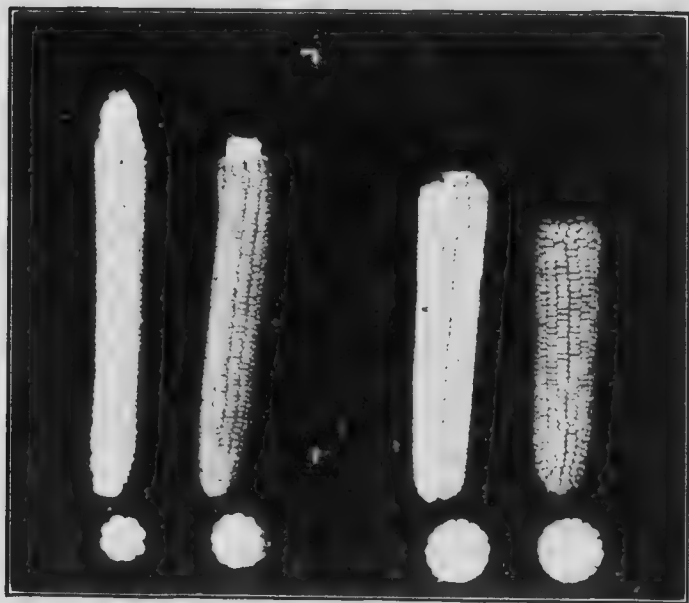
Where either heavy clay land or very level land not under-drained is to be used, it is not infrequently advisable to make special preparation by ploughing and working in a special way.



No. 1 Hand Corn Planter.







No. 7 Flint Varieties
North Dakota White (white),
Compton's Early (yellow).

Dent Varieties
White Cap Yellow Dent (white),
Selected Leaning (yellow).

Photo. F. T. Shutt.



No. 8 Field of corn. Team weighing 3,500 pounds.



No. 9 The harvest.



No. 10 Cutting into the Silo.



No. 11 - Corn Curing in Shock.



No. 12 Feeding Ensilage.

Photo, F. T. Shutt.

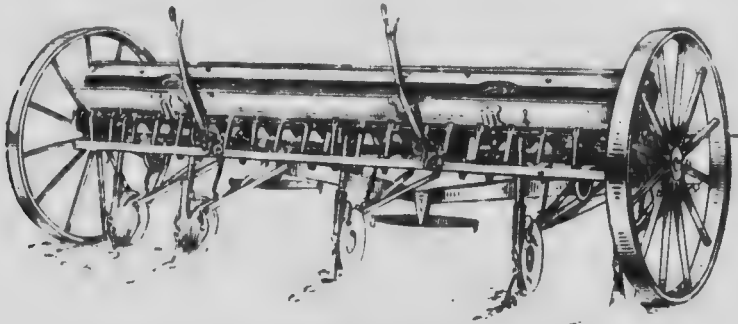


The land should be ploughed in nicely rounded ridges exactly 10 ft. 6 in. from centre to centre. All necessary cultivation should be so done as to preserve the rounding surface of the ridges, and the dead furrows should be kept clean and should open into a well-kept ditch, thus insuring good drainage.

In planting, the first row should be run down the middle of the ridge and two others on the same ridge, one on each side, 42 inches away. Thus the rows on the whole field will be uniformly 3 ft. 6 in. apart and always clear of dead furrows.

When to Sow.

Corn should be sown as early as weather and soil conditions permit. From the 15th to the end of May, according to district and season, is a very good rule. Very seldom will it do to sow later than June 5th or 6th. Sow when soil is warm and dry.



No. 2—Seeder set to sow corn in rows 42 inches apart. Three-horse
7-inch space. entry marker,

Methods of Seeding.

Corn for forage or ensilage may be planted in rows or hills. If planted in rows as is usually advisable, the rows should be at least 42 inches (3 ft. 6 in.) apart. The plants should stand about 8 inches apart in the rows. In seeding, it would not be advisable to try to sow as sparsely as this. It is better to give a rather heavier seeding and then thin out to the desired thickness with a hoe when plants are 6 or 8 inches high.



No. 3—Marker where corn is to be sown in hills by hand.

If land intended for corn is very dirty, whether from the presence of weed seeds or couch grass, it is usually advisable to plant in hills. The hills should be at least 3 ft. apart each way and from 3 to 5 kernels should be planted in each hill.

For planting in rows there are special corn planting machines made by various agricultural implement manufacturers. Where the farmer has a grain seeder that sows in rows, he can, by closing up part of the seed spouts, use it as a corn planter and so get along without the special implement. (See cut No. 2.)

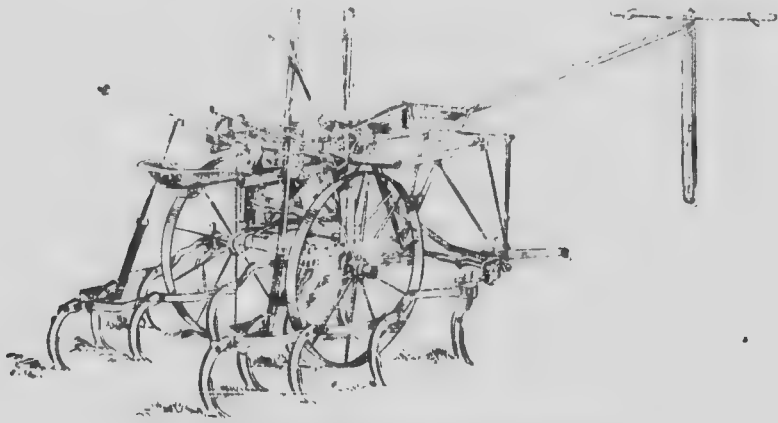
If it is desired to plant in hills, here again special horse planters are available. There are also hand planters of various descriptions on the market which will enable a man to plant from two to four acres a day when the land is ready. If no planter is available, planting may be done with a hoe or even with the foot, when the soil is loose and friable. (See cut No. 4 for hand planters.)

If the hill planting is to be done other than with a horse planter, it will be necessary to mark the land off into three foot squares, the hills to be at the corners of the squares. This may be done by a man dragging a heavy chain back and forth across the field till it is marked off into three foot strips, then doing the same thing lengthwise till the whole field is marked off into three foot squares.

A better plan and a much more rapid, however, is to construct a marker to run by horse power, then mark the field off into squares by running first lengthwise and later crosswise. (See cut No. 3.)

Suitable Varieties.

The varieties of corn to sow will depend upon the district where the seeding is to be done. For the Maritime Provinces, for those parts of Quebec north of Montreal and St. Hyacinthe, and east of Three Rivers, and for northern Ontario, Manitoba, Saskatchewan, Alberta and British Columbia, the flint varieties should be grown most largely. Some of the best varieties are Longfellow, Compton's Early, Angel of Midnight, North Dakota White Flint and Sandford. (See cut No. 7.) In these same districts a few of the dents may be expected to give good results, the best being White Cap Yellow Dent. In those parts of Ontario east and north of Toronto, as far as Muskoka, in the southern parts of Quebec and in the Eastern Townships, considerably larger varieties may be expected to give good results. As varieties suitable for said districts might be mentioned any of the flints, White Cap Yellow Dent, Leaming and occasionally some of the larger varieties as Mammoth Cuban or Early Mastodon. In those parts of Ontario south and west of Toronto, any variety, no matter how large, may be expected to give satisfaction. When sowing in rows, it will be found best to sow about 25 lbs. of the flint varieties and about 30 lbs. of the dent varieties per acre. Sowing in hills requires less seed, about 15 lbs. flint and 18 lbs. dent per acre.



No. 5 Two-horse Two-row Riding Cultivator.

Early Crop Treatment.

A few days after seeding, say the third or fourth day in warm weather, or the fourth or fifth day in cool weather it is well to run over the field with a slant tooth harrow or lacking this, with a light smoothing harrow. This will break the crust, destroy any weeds and help warm the soil, thus encouraging growth of the corn. A few days after the corn is up, and when it can be seen distinctly in rows, it is often advisable to run the light smoothing harrow over it again. This time it had better be run across the rows. Subsequent cultivation will need to be done with special cultivators.

Later Cultivation.

For working the land until the corn stands about three feet high in the rows or hills, the two-horse riding cultivator will give the best results. (See cut No. 5.) This implement straddles a row and gives the soil on either side thereof thoroughly good cultivation, being in this respect much superior to the one-horse walking cultivator. (See cut No. 6.) The latter implement will, however, be found valuable and necessary after it is no longer possible to work the two-horse cultivator.



No. 6 Walking Single Cultivator

The cultivator should be run through the crop, shortly after any considerable rain fall or about once a week in dry weather. As the season advances, a lighter and lighter cultivation should be given. Work may be stopped usually when the corn is so high as to hide the horse and driver from view, but sometimes, however, later cultivation will pay. This will be the case when a superabundance of weeds shows up, as may occur in a very wet season, or when the corn suffers from drought in a very dry season.

Very seldom, if ever, will it be found advisable to rib up the corn. Such treatment might occasionally be advisable in a wet season on very low-lying or heavy land, never on light soils.

Hand Work.

A certain amount of hand hoeing is usually necessary. This should be done first when the corn is six or eight inches high. The thinning to eight inches apart in the rows should receive attention at this time. Plants should be cut clean out to prevent suckers coming on again. Later it will likely be found advisable to again go over the field and remove any further weeds that may have come up in the rows. As already stated, when a field is particularly dirty, it is advisable to sow in hills and

the cultivators can then be worked both ways. The amount of hand hoeing will in this way be very much lessened.

Enemies and Diseases.

The corn crop in Canada is remarkably free from enemies and diseases. In our experience here, crows at seeding time and smut at earing time are about the only troubles worthy of note.

Crows.—The crow generally attacks the crop when first the young plants shoot through the soil, or even earlier. There are two effective ways to guard against this winged enemy.

First.—If corn is to be planted by hand, the following method will be found effective. Immerse corn for two or three minutes in water as hot as can be borne by the hand. Drain water off and while still damp and warm add warm coal tar at rate of half a cupful per gallon of corn. Thoroughly mix the corn and tar till every kernel has more or less tar on it. As a drier add a small amount of lime, plaster, or even dry road-dust. If the mixing and drying has been well done, seed so prepared may be sown by machine.

Second.—When crows are noticed on the field, take some corn, say two gallons, more or less, according to size of field it is desired to protect and boil for about thirty minutes in water, just sufficient to cover corn and an inch to spare. To the water and corn, before boiling, add about $\frac{1}{2}$ oz. of strychnine, or better still of strychnine sulphate for each gallon of water. Allow the corn to lie in the strychnine and water over night. In the morning, drain off any water remaining and scatter the corn thinly over the field off which it is desired to frighten the crows.

In making use of the above plan, great care should be taken to pour water off corn into some hole, or on some spot not likely to be frequented by children or domestic animals. Care should also be taken to keep poultry off corn field for some two or three weeks after poisoned corn has been scattered thereon.

Nothing practicable can be done to prevent smut, excepting possibly the gathering and burying of affected ears.

When to Harvest.

Corn will be ready to cut for forage or ensilaging when the grain or kernel is in the dough stage and has begun to glaze. If weather conditions are adverse, that is, cold and wet, it is often advisable to cut before this stage of maturity is reached, when for any reason the crop is late maturing. Frost does not spoil the crop for either forage or ensilage, but the feeding value is quite materially lessened if the leaves and stalks are badly frozen.

Cutting the Corn

Special machines called corn harvesters are manufactured by various agricultural implement companies, and, where considerable areas of corn are grown, will be found practical and economical. The farmer who grows only a few acres would not find it to his advantage to invest in such a machine. The corn may be cut with hand sickles of various descriptions or with hoes. A man can cut from three-quarters of an acre to an acre and a quarter in a ten-hour day, using one of the above small tools. With the corn harvester, in ten hours, a man with a good team can cut from four to six acres, according to condition of the corn. (See cut No. 8.)

Making and Preserving Dry Corn Fodder.

Where no silo is at hand to use in storing and preserving the corn, very satisfactory results may be expected by drying the crop for fall or winter use. To preserve in

this way, the corn should be bound into sheaves 8 to 12 inches in diameter and five or six of these made into an open but firmly built shock, the tops being bound together to lend further strength. These shocks, if well built, may be expected to stand as long as it is desired to leave them in the field. In fact not a few farmers haul them in as needed all winter. (See cut No. 11.)

If barn room is available, they might be hauled in and stored on top of mows or elsewhere, care being taken to place them erect and not to pack too tightly as there is danger of heating or mould. If the corn is fairly dry and straw is plentiful, the corn might be hauled and stored among the straw, placing it in layers, being careful to have a good thick layer of straw, at least 2 feet, between the layers of corn sheaves.

Where it is not desired to leave in shocks in the field and no barn room is available, a fairly satisfactory plan is to haul to the near neighbourhood of barn and stand in rows on either side of trestles so arranged as to allow prevailing winds to blow down alleys between rows of corn.

Feeding Corn Fodder.

The best method of feeding dry corn is to run enough of it through the cut box to last a week or ten days. Mix straw or cut hay with this cut fodder corn. This mass will quite probably heat to a certain extent but this will increase the palatability, unless allowed to lie for too long a time. It is possible of course to feed without cutting, but considerable loss of food and comparatively unsatisfactory results may be anticipated when the forage is fed uncut.

Ensiloing.

The really best way to preserve corn and the way to get the greatest returns from the field in the shape of food, is to store it in a good silo. (See cut No. 10.) If very juicy or lacking maturity when cut, it is often well to let it lie for a day or two between cutting and ensiloing. If very dry when cut, it is sometimes well when ensiloing to pour a few gallons of water around the wall of the silo for each foot in height as the ensilage rises, say one gallon water to one foot in circumference of the silo at each foot in height of rising ensilage.

In any case, the corn should be cut into short lengths, the shorter the better, say half-inch lengths and well mixed, the leaves with the stems and ears all the way up. It is well also to tramp and fill most carefully around the walls.

It is impossible to properly fill the silo at the one time. It should be filled to the top, allowed to settle for a few days then filled again. It is advisable to repeat this settling and filling more than once if possible.

When filled for the last time the surface should be nearly levelled, slightly higher in the middle if anything, and well tramped. If possible to put a few barrels of water on the surface, less waste may be anticipated. Particularly is this true if the water is used freely around the wall.

The Cut Box.

Two distinct types of machine exist for cutting corn into the silo, the chain elevator cut box and the blower.

The chain elevator cut box will do satisfactory work with much less power than will the blower, hence is the advisable kind to buy for the man whose motive power is small. A good two-horse tread power will drive a fair sized chain elevator cut box at moderate speed and raise the silage 30 feet. A very much greater power is required to drive a cut box of the blower type. Another reason in favour of the chain elevator type for the farmer who must own his cut box is the smaller number of men required to handle it economically. However, where all the men and horses necessary can be

counted upon and a powerful engine is available for driving, then the blower type of cut box may be expected to do the work of filling the silo more cheaply and much more expeditiously than one of the chain elevator sort.

In any case, great care should be taken to keep all machinery in good running order, and particular attention should be paid to keeping the cut box knives sharp and properly set.

Using Ensilage

The ensilage will of course always be taken from the top when it is being fed out. The surface should be kept as level as possible and in winter it will be found good practice to keep the surface a little lower around the wall than in the centre. This will largely prevent freezing to the walls or into the body of the ensilage. Frozen ensilage once it is thawed out, is, however, quite as good as any other.

Ensilage may be fed direct to cattle just as it comes from the silo, but a better plan is to add to the ensilage a considerable amount, say 10 or 15 lbs. of cut hay or chaffed straw to 100 lbs. ensilage. If floor space is available for the purpose, mixing sufficient cut hay or chaff and ensilage to last several days (3 or 4) will prove to be a very satisfactory method of preparing feed for cattle and a method that they would seem to approve. Any meal to be fed should be thrown on the mixture of straw and ensilage after it is in the manger. Stir the whole mass after sprinkling meal. An average cow will consume about 40 lbs. of such a mixture of ensilage and straw or hay a day.

Rations Including Corn Ensilage.

Corn silage and straw or chaff, while together making up a most excellent foundation or base, do not alone constitute a well-balanced or suitable ration for any class of live stock. For feeding heifers or young stock some bran and clover hay should be added. A suitable ration would be:—

For yearling heifers:—

Corn silage.	25 to 35 lbs.
Straw or chaff.	4 " 6 "
Clover hay.	4 lbs.
Bran.	2 "

For dry cow:—

Corn silage.	50 to 60 lbs.
Straw.	8 " 10 "
Clover hay.	4 lbs.
Bran.	1 to 2 lbs.

For cow in milk:—

Corn silage.	15 lbs.
Straw.	6 "
Clover hay.	4 to 6 lbs.

Meal mixture: bran, oats, gluten or oil-cake meal or cottonseed meal, equal parts. One pound meal to three or four pounds milk produced per diem.

For steers running over winter (1,000 pounds weight):—

Corn silage.	60 to 75 lbs.
Straw.	8 to 12 lbs.
Clover hay.	2 to 4 lbs.

For fattening steers (1,000 pounds):—

Corn silage.....	50 to 60 lbs.
Straw.....	6 to 10 lbs.
Hay.....	3 to 6 lbs.
Meal—Starting at one pound go up to 10 lbs. per diem.	

A good meal mixture would be corn, bran, barley and oil cake meal, gluten meal or cottonseed meal. Take bran and corn, bran and barley, equal parts, or bran, corn and barley, equal parts, to which add an amount of any one of the last three equal to one-quarter of the total weight of the meal mixture when ready to feed.

Cost of growing One Acre Corn and putting same in Silo.

Ploughing.....	\$2 00
Disc harrowing, $\frac{1}{4}$ day.....	1 25
Harrowing, $\frac{1}{4}$ day.....	0 62 $\frac{1}{2}$
Seed, 20 lbs. at 2 cents per lb.....	0 40
Planting $\frac{1}{8}$ day with team.....	0 25
Harrowing and cultivating (10 times).....	2 50
Hoeing, $1\frac{1}{2}$ days.....	2 25
Cutting, $\frac{1}{4}$ day, with team.....	0 62 $\frac{1}{2}$
Hauling, one day, team.....	2 50
Men loading, unloading and ensilaging, 3 days.....	4 50
Use of power for cutting, &c.....	1 00
Use of machinery and twine.....	50

\$18 40

To this might be added \$3 for rent and \$3 for part of manure used up. This would make a total cost of \$24.50. From an acre of corn worked as indicated, from 14 to 20 tons ensilage might be expected. Supposing an average crop, say 16 tons, then one ton corn in the silo, ready to feed, would have cost \$1.53.

Silos.

Stave silos are entirely satisfactory. They should, however, be very carefully and staunchly built on a good cement foundation. The cost will run from \$1 up to \$3 per ton capacity.

Cement silos are very durable and quite satisfactory, if well built. They will cost from \$2 to \$5 per ton capacity. Care must be taken to build of good material and to strongly reinforce with wires or bands.

The round shape is essential to best results. Where wood is used only one thickness of two inch staves, or one thickness inch dressed lumber in square or straight line walls should be used.

Equipment.

Cost of extra equipment necessary to start into corn cultivation and ensilaging on a large scale on a Canadian farm.

Double cultivator.....	\$ 60 00
Single cultivator.....	6 00
Corn harvester.....	140 00
Corn blower or cut box.....	140 00
Silo—say about.....	300 00
Total.....	\$646 00

Such equipment may be expected to last 10 or 15 years, say 13 years, or \$60 a year. The whole cost is likely to be repaid in about three years. The silo might quite possibly last 20 years.

Summary.

1. Corn will grow on any well drained and well manured soil.
2. Thorough soil preparation is absolutely necessary.
3. Corn should not be sown closer than 3 ft. apart in hills, or if in rows, 3½ ft. apart, 8 inches between plants in the rows.
4. Sow varieties suitable for district. Varieties that will mature fairly well are necessary.
5. Keep field well cultivated and free from weeds.
6. Cut in dough stage.
7. Preserve in silo if possible.
8. Mix chaff or cut straw with ensilage when feeding.

